

SEQUENCE LISTING

(110> KUSTERS, Johannes G. CATTOLI, Giovanni

<120> HELICOBACTER FELIS VACCINES

<130> KUSTERS

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<141> 2001-07-13

<150> EP00202565.8

<151> 2000-07-17

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<170> PatentIn Ver. 2.1

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Tyr Tie Gly Ser Val Glu Glu Gly Lys Tie Ala Asp Leu Val Val	2153	c r	aç Se	va_	гy	G]	cac His	acc Thr	tg Leu	Ala	Pro	ac (itc a	act a	yr :	ys :	cc a er I	c t e S	at Il	tac Tyr
## Second Process of the Second Process of t	2201	g .1	g¹ Va	gtg Val	eu	T)	gac Asp	gcc Ala	atc Ile	aag Lys	Зlу	3lu	gaa Slu	gtg (Val	ct (Ser	ly:	le (t a	ta Ty	gag Glu
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cgt ggc aaa aaa acc gtt gct gaa ctt atg gaa gaa tgt atg cac tt Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Ph 50 55 60	t 192 .e
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agc cca g Ser Pro A	at gaa aa sp Glu As 29	n Thr Leu	gat tta Asp Leu	gtg atc Val Ile 295	acc aac gc Thr Asn Al	g atg att a Met Ile 300	913
atc gac t Ile Asp T	ac acc gg yr Thr Gl 305	g att tat y Ile Tyr	aaa gcc Lys Ala 310	Asp Ile	ggt att aa Gly Ile Ly 31	s Asn Gly	961
Lys Ile H	at ggt at is Gly Il 20	t ggc aag .e Gly Lys	gcg ggg Ala Gly 325	aac aaa Asn Lys	gac atg ca Asp Met Gl 330	a gat ggc n Asp Gly	1009
gta agc c Val Ser F 335	ct cat at	g gtc gtg et Val Val 340	. Gly Val	ggc aca Gly Thr	gaa gca ct Glu Ala Le 345	a gca ggg eu Ala Gly	1057
gaa ggt a Glu Gly N 350	itg att af Met Ile I	ct acc gct le Thr Ala 355	gly Gly	g atc gat y Ile Asp 360	tcg cac ac	cc cac ttc nr His Phe 365	1105
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Leu	Ser	Pro	Gln	Gln 370	Phe :	Pro	Thr	Ala	Leu 375	Ala	Asn	Gly	Val	Thr 380	Thr	
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gag Glu	tat Tyr 415	tct Ser	atg Met	aat Asn	gtg Val	ggc Gly 420	ttt Phe	ttg Leu	ggc Gly	aaa Lys	ggc Gly 425	aat Asn	agc Ser	tcc Ser	agt Ser	1297
aaa Lys 430	Lys	caa Gln	ctc Leu	gta Val	gaa Glu 435	caa Gln	gta Val	gaa Glu	gcg Ala	ggc Gly 440	Ala	att Ile	ggc	ttt Phe	aaa Lys 445	1345
ttg Leu	cat His	gaa Glu	gac Asp	tgg Trp 450	Gly	aca Thr	aca Thr	cca Pro	agt Ser 455	Ala	atc Ile	gat Asp	. cac	tgc Cys	ttg Leu	1393
ago Ser	gta Val	gca Ala	gat Asp 465	Glu	tac Tyr	gat Asp	gto Val	g caa L Glr 470	val	. tgt . Cys	ato	cac His	acc Thi	c Asp	acg Thr	1441
gto Val	aat L Asr	gaq 1 Gl1 480	Ala د	a ggt a Gly	tat Tyr	gta Val	gat Ası 48	o Asr	aco Thi	cta Le	a aat 1 Asi	gco n Ala 490	a Me	g aad t Asi	ggg Gly	1489
cgo Arc	g Ala	a Il	c cat	s Ala	e tac a Tyr	Hi	s Il	e Gl	g gga	a gc y Al	g gg a Gl; 50	y Gl	a gg y Gl	а са у Ні	c tca s Ser	1537
cc Pr 51	o As	t gt p Va	t at 1 Il	c ace	c ato r Met 51!	Al.	a gg a Gl	c ga y Gl	g ct	c aa u As 52	n Il	t ct e Le	a cc u Pr	c tc o Se	c tcc r Ser 525	1585
ac Th	c ac r Th	c cc r Pr	c ac	t at r Il 53	e Pr	c ta o Ty	t ac r Th	c aț ir Il	t aa e As 53	n Th	g gt r Va	t gc 1 Al	a ga .a Gl	a ca u Hi 54	c tta s Leu 0	1633
ga As	c at	g ct t Le	c at u Me	t Th	c tg r Cy	c ca s Hi	c ca s Hi	ac ct Ls Le 55	u As	c aa p Ly	ia co 75 Ar	ıc at	c co e Ai 55	cg G1	g gat u Asp	1681
ct	c ca	ıg tt	t to	ec ca	a ag	c cg	rt at	to og	ic co	c g	gc to	ct at	t go	ec go	t gaa	1729

Leu Gln Phe		Ser Arg	Ile Arg	g Pro G	ly Ser	Ile Ala 570	Ala Glu	
gat gtg ctc Asp Val Lev 575	cat gat His Asp	att ggc Ile Gly 580	gtg ato	c gcg a e Ala M	tg aca et Thr 585	agc tcg Ser Ser	gat tcg Asp Ser	1777
caa gca atg Gln Ala Met 590	ggg cgc : Gly Arg	gct ggg Ala Gly 595	gaa gt Glu Va	l Ile P	ct aga Pro Arg	act tgg Thr Trp	caa act Gln Thr 605	1825
gca gac aag Ala Asp Ly:	g aat aaa s Asn Lys 610	Lys Glu	ttt gg Phe Gl	t aag o y Lys I 615	ctt cct Geu Pro	gaa gat Glu Asp	ggt gca Gly Ala 620	1873
gat aat ga Asp Asn As	c aac tto p Asn Phe 625	c cgc ato E Arg Ile	aaa cg Lys Ar 63	g Tyr 1	atc tcc Ile Ser	aaa tac Lys Tyr 635	acc att Thr Ile	1921
aat ccc gc Asn Pro Al 64	a Leu Thi	c cat ggo r His Gly	gtg ag Val Se	gc gag t er Glu t	tat atc Tyr Ile	ggc tct Gly Ser 650	gtg gaa Val Glu	1969
gag ggc aa Glu Gly Ly 655	g atc gc	c gac tto a Asp Leo 66	ı Val Va	tg tgg al Trp	aat cct Asn Pro 665	Ala Phe	ttt ggt Phe Gly	2017
gta aaa co Val Lys Pi 670	c aaa at o Lys Il	c gtg at e Val Il 675	c aaa g e Lys G	gc ggt ly Gly	atg gtg Met Val 680	gtg tto Val Phe	tct gaa e Ser Glu 685	2065
atg ggc ga Met Gly As	at tot aa sp Ser As 69	n Ala Se	t gtg c r Val P	cc aca ro Thr 695	cct cad	g ccg gtt n Pro Vai	t tat tac 1 Tyr Tyr 700	2113
cgc gaa a Arg Glu M	tg ttt gg et Phe Gl 705	gg cat ca .y His Hi	s Gly I	ag gcg Lys Ala 710	aaa tt	t gac ac e Asp Th 71	r Ser lle	2161
Thr Phe V	tt tcc aa al Ser Ly 20	aa gtc go ys Val Al	c tat o a Tyr 0 725	gaa aat Glu Asn	ggc gt Gly Va	g aaa ga l Lys Gl 730	a aaa cta u Lys Leu	2209
ggc tta g Gly Leu G 735	ag cgc aa lu Arg L	ys Val Le	a ccc q eu Pro \ 10	gtg aaa Val Lys	aac tg Asn Cy 74	s Arg As	c atc act	2257
aag aaa g	ac ttc a	aa ttc a	ac aac	aag acg	gcg ca	t atc ac	t gtc gat	2305

Lys Lys Asp Phe Lys Phe Asn Asn Lys Thr Ala His Ile Thr Val Asp 750 765	
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20 25	
Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg 40 45	
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85 90	
Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys	
100 105 110 Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr	
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Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser	
His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu	
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Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp	
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Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly

Tyr Lys Ala Asp lie Gly lie Lys Ash Gly Lys 110 his Gly 120 Gly

85

90

95

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val

Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr 115 120 125

Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe 130 135 140

Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr 145 150 150

Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp 165 170 175

Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val 180 185 190

Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu 195 200 205

Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly 210 215 220

Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr 225 230 235 240

Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr 245 250 255

Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr 260 265 270

His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met 275 280 285

Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro 290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys 315 310 305 His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser 330 325 Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile 345 340 Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala 365 360 Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys 380 375 Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp Asn Phe Arg 395 390 Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His 410 405 Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp 425 420 Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val 440 Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala 460 455 Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His 475 470 His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val 490 485 Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Lys Val 505 Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe 520 Asn Asn Lys Thr Ala His Ile Thr Val Asp Pro Lys Thr Phe Glu Val 540 535 Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Ala Ser Glu Val Pro 560 555 550 Leu Ala Gln Arg Tyr Thr Phe Phe 565

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Va	al L	vs L	eu T	hr P	ro L	ys G	lu G	ln G	lu L	ys P	he L	eu L	eu T	yr T	yr	
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aca (aac	gaa	gtg	gct	aga	aag (cgc	aaa	gca	gag	ggc	tta	aag	ctc	aat	95
Ala	Glv	Glu	Val.	Ala	Arg	Lys i	Arg	Lys	Ala	Glu	Gly	Leu	Lys	Leu	Asn	
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Asp	Leu	Gly	Val	Glu		Thr	Phe	Pro	Asp		Thr	ьys	Leu	Vai	95	
80					85					90					. 33	
												~~~	~~+	<b>~</b> 33	ata	335
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Val	Asn	Trp	Pro		Glu	Pro	Asp	GLu		Pne	гàг	Ala	GIY	110	Val	
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Lys	Phe	Gly			гÀг	Asp	116	120		ASII	val	OLY	125	010		
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Thr	Glu			vaı	Thr	Asn	135		FIO	шуз	, 501	140			3	
		130)				133	'								
						~~~	3.00	. 220	י אבר	aca	tto	r aaa	tto	gat	cgg	479
agc	cat	tto	cac	. Ttc	Dha	. yaa . clu	Thr	. aac	. aug . Lvs	Δla	. Leu	LVS	Phe	Asp	Arg	
Ser			: HIS	Pne	: FIIC	150		. ADI	. 272		155	<b>_</b> -		-	-	
	145	)				150										
		~~~	. + - +		. 222	. כתכ	cta	a gat	att	. cc	c tct	. ggc	aad	acc	cta	527
gaa	. aaa	. ycc	, val	. 99c	, uuc	. Ogo	Lei	ı Ası	o Ile	Pro	o Sei	c Glv	Ası	n Thi	Leu	
		, Alc	a iyi	. 51)	, by: 165			r		170	0	-			175	
160	,				100	-										
000	++	- aa	י מר:	a aas	a caa	a acc	: cat	t aaa	a qtc	ca	g tta	a ato	: cc1	t cti	ggc	575
cgc	. act	- 999	ی برد	- 990					. · د		-					

Arg	Ile	Gly	Ala	Gly 180	Gln	Thr	Arg	Lys	Val 185	Gln :	Leu	Ile :	Pro	Leu 190	Gly	
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GJ?	gaa Glu 350	Gl	ato y Met	g att	att	acc Thr	Ala	ggg Gly	ggg Gly	atc Ile	gat Asp 360	Ser	Cac	acc Thr	cac His	1104
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gaa gag tat Glu Glu Tyr 415	tct atg aa Ser Met A	at gta ggc sn Val Gly 420	Phe Leu	ggc aaa Gly Lys	ggc aat agt Gly Asn Sei 425	tct 1296 Ser
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gaa Glu 685	ı Met	: Gl ²	gat Asp	tct Ser	aac Asr 690	Ala	tco Ser	gto	g cco	acg Thi	Pro	caq Glr	g ccg	g gtt o Val	tat Tyr 700	2112
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Val Lys L	eu T	hr I	Pro	Lys	Glu	Gln	Glu		Phe	Leu	Leu	Tyr	Tyr 15	Ala
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Gly Glu V		la <i>1</i> 20	Arg	Lys	Arg	Lys	A1a 25	GIU	GTĀ	ьeu	пуз	30	A3II	
Pro Glu A			Ala	Tvr	Ile	Ser		His	Ile	Met	Asp	Glu	Ala	Arg
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65			_	70		_	7	~1	75	Tuc	Len	Val	Thr	
Leu Gly V	/al G	lu.		Thr	Phe	Pro	Asp	90 GIÀ	1111	гур	Бец	Val	95	7 42
Asn Trp I	ero T	ם ו	85 311	Pro	Asp	Glu	His		Lys	Ala	Gly	Glu	Val	Lys
Asn Tip i		100	O1 u	110	1.00		105		-		_	110		
Phe Gly (Lys	Asp	Ile	Glu	Leu	Asn	Val	Gly	Lys	Glu	Val	Thr
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Glu Leu (Glu V	/al	Thr	Asn	Glu	Gly	Pro	Lys	Ser		His	Val	Gly	Ser
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His Phe	His I	Phe	Phe		Thr	Asn	Lys	Ala	Leu	ьys	Pne	Asp	Arg	160
145			_	150	.	7	T10	Dro	155	Gl v	Asn	Th r	Leu	
Lys Ala '	Tyr (Gly	Lys 165	Arg	Leu	Asp	116	170		GIY	ASII	1	175	
Ile Gly	מות	Cl v		Thr	Ara	Lvs	Val			Ile	Pro	Leu		Gly
ile Giy		180	01		9	-1-	185					190		
Ser Lys	Lvs '	Val	Ile	Gly	Met	Asn	Gly	Leu	Val	Asn	Asn	Ile	Ala	Asp
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1	_			5 - Ta:		. 7.61	o Trib	10 2 N S 1		ı Tr	- Δ1 <i>i</i>	a Gli		
Gly Asp	ьуs	Val 20		э тел	r GT	y AS	2		וטעיק	~1		30)	
His Asp	ጥተታም			r ጥህ	r Gl	v Gli			u Ly:	s Phe	e Gl	y Ala	a Gl	y Lys
	35					4	0				4.	5		
Thr Ile	Ara	Glu	Gl;	y Me	t Gl	y Gl:	n Se	r As:	n Se	r Pr	o As	p Gl	ı As:	n Thr
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			Asn 100					105					110		
		115	Gly				120					125			
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			Asp	165					170					175	
			Arg 180					185					190		
		195					200					205			
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			Thr 260					265					270		
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305	,		e Asn		310)				315					320
			ı Asp	325	5				330					335	
			340)				345	5				350		Ile
		35	5				360)				365	•		Ala
	37	0				37	5				380)			Lys
38	5				39	0				395	5				Arg 400
				40	5				41	0				415	
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ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg cgc 145
Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg
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cgt ggc aaa aag acc gtt gcg gaa ctt atg gaa gag tgt atg cac ttt 193
Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe
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ttg aaa aaa gac gag gtg atg ccc ggt gtg ggg aat atg gtc cct gat 241 Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp 65 70 75 80

tta ggc gtg gaa gct act ttt ccc gat ggc acc aaa ctc gta acc gtg 289 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val 85 90 95

aat tgg ccc atc gaa ccc gat gaa cac ttc aaa gcg ggc gaa gtc aaa 337

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	cta Leu 130	gaa Glu	gtt Val	acc Thr	aac Asn	gaa Glu 135	gga Gly	cct Pro	aaa Lys	tcc Ser	ttg Leu 140	cat His	gtg Val	ggt Gly	agc Ser	433
cat His 145	ttc Phe	cac His	ttc Phe	ttt Phe	gaa Glu 150	gcc Ala	aac Asn	aag Lys	gca Ala	ttg Leu 155	aaa Lys	ttc Phe	gat Asp	cgg Arg	gaa Glu 160	481
aaa Lys	gcc Ala	tat Tyr	ggc	aaa Lys 165	cgc Arg	cta Leu	gat Asp	att Ile	ccc Pro 170	Ser	ggc Gly	aac Asn	acg Thr	cta Leu 175	cgc Arg	529
att Ile	ggg Gly	gca Ala	gga Gly 180	caa Gln	acc Thr	cgt Arg	aaa Lys	gtg Val	Gln	tta Leu	atc Ile	cct Pro	ctt Leu 190	GIZ	ggc Gly	577
agt Ser	aaa Lys	aaa Lys 195	Val	att Ile	ggc	atg Met	aac Asn 200	Gly	g ctt 7 Leu	gtg Val	aat Asr	aat Asr 205	ı Ile	gca Ala	a gat a Asp	625
gaa Glu	cgc Arg 210	His	aaa Lys	cac	aaa Lys	gcg Ala 215	Let	a gaa	a aaa u Lys	gca S Ala	a aaa a Lys 220	s Sei	cac r His	c gga	a ttt y Phe	673
	Lys		, gga	gact	ccc	atg Met	aaa Lys	atg Met 230	aaa Lys	aaa Lys	caa Gln	gag Glu	tat Tyr 235	gta Val	aat Asn	722
acc Thr	tac Tyl	gga Gly	Pro	aco Thi	c aca	a ggo	gae y Asj 24	р Гу	a gte s Va	g cg	c tt g Le	a gg u Gl 25	y As	t ac p Th	c gat r Asp	770
ctt Lei	tgq Trp 25	Ala	a gaa a Glu	a gta u Vai	a gaa	a ca u Hi 26	s As	c ta p Ty	t ac r Th	c ac r Th	t ta r Ty 26	r Gl	c ga y Gl	a ga u Gl	g ctc u Lev	: 818
aaa Lys 270	s Ph	t gg e Gl	c gc	g gg a Gl	t aa y Ly 27	s Th	t at r Il	.c cg .e Ar	rt ga :g Gl	g gg u Gl 28	у Ме	g gg t Gl	ıt ca .y Gl	g ag .n Se	ıc aat er Asr 285	1
ag [,]	t cc	a ga	t ga	a aa	c ac	c ct	a ga	it tt	a gt	c at	c ac	c aa	ac go	eg at	g att	914

Ser	Pro	Asp	Glu	Asn 290	Thr	Leu	Asp	Leu	Val 295	Ile	Thr	Asn	Ala	Met 300	Ile	
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									aac Asn							1010
									ggc Gly							1058
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									cgc Arg							1250
		Ser							ggc Gly							1298
				-		Gln			gcg Ala							1346
					Gly				agt Ser 455						Leu	1394
-	_	_		Glu					gtt Val					Asp		1442
gtc	aat	gag	gca	ggt	tat	gta	gat	gac	acc	ctg	aat	gcg	atg	aac	ggg	1490

Val	Asn	Glu 480	Ala	Gly	Tyr	Val	Asp 485	Asp	Thr	Leu	Asn	Ala 490	Met	Asn	Gly	
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								gag Glu								1586
								att Ile								1634
								cta Leu 550								1682
								cgc Arg								1730
								atc Ile								1778
	Ala							gtg Val			Arg					1826
					Lys			ggt Gly		Leu					Ala	1874
_		_		Phe					Tyr					Thr	att Ile	1922
		_	Leu					Ser					Ser		gaa Glu	1970
		Lys					Val					Ala			ggt Gly	2018
gto	, aaa	cct	aag	, att	gtg	ato	aaa	ggc	ggt	ato	g gto	ggto	: ttc	tct:	gaa	2066

Val Lys Pro Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser Gl 670 675 680 68	
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cgc gaa atg ttt ggg cat cac ggc aag gcg aaa ttt gac acc agc at Arg Glu Met Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Il 705 710 715	
act ttt gtt tcc aaa gtc gcc tat gaa aat ggc gtg aaa gaa aaa ct Thr Phe Val Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Le 720 725 730	
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cct aaa acc ttc gag gtc ttt gta gat ggc aaa ctc tgc acc tct aa Pro Lys Thr Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Ly 770 775 780	
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Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Ph	ne

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp 70 75 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val 90 Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr 120 Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser 130 135 His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu 150 155 Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg 170 Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly 185 Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp 195 200 Glu Arg His Lys His Lys Ala Leu Glu Lys Ala Lys Ser His Gly Phe 215 220 Ile Lys 225

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Pro	Thr	Ala	Leu	Ala	Asn 150	Gly	Val	Thr	Thr	Met 155	Phe	Gly	Gly	ĠĮÀ	Thr 160
	Pro	Val	Asp	Gly 165		Asn	Ala	Thr	Thr	Ile	Thr	Pro	Gly	Lys 175	Trp
Asn	Leu	His	Arg 180		Leu	Arg	Ala	Ala 185		Glu	Tyr	Ser	Met 190	Asn	Val
Gly	Phe	Leu 195		Lys	Gly	Asn	Ser 200	Ser	Ser	Lys	Lys	Gln 205	Leu	Val	Glu
Gln	Ile 210	Glu	Ala	Gly	Ala	Ile 215	Gly	Phe	Lys	Leu	His 220	Glu	Asp	Trp	Gly
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Tyr 305	Thr	Ile	Asn	Thr	Val 310	Ala	Glu	His	Leu	Asp 315	Met	Leu	Met	Thr	320
His	His	Leu	Asp	Lys 325	Arg	Ile	Arg	Glu	Asp 330	Leu	Gln	Phe	Ser	Gln 335	Ser
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_			420					425					430		Asp
		435					440					445			Val
	450					455					460				Ala
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Thr Pro Lys Glu Glu Lys Phe Leu Leu Tyr Tyr Ala Gly Glu Val
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Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg Arg Gly Lys

40 45 50

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Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe Leu Lys Lys
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Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp Leu Gly Val
70 75 80

gaa gcc act ttc ccc gat ggc acc aaa ctc gta act gtg aat tgg ccc 344

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-			_	gga Gly												488	
		-		aac Asn												536	
				gat Asp												584	
			_	aaa Lys												632	
				aac Asn 200												680	
				cta Leu					șer						taa	728	
gga	gact		_	aaa a Lys I					Glu '					Tyr		777	
				gat Asp 245											Ala	825	
				gac Asp										Phe	ggt Gly	873	
gca	ggt	aaa	act	atc	cgt	gag	ggt	atg	ggt	cag	agc	aat	ago	сса	gat	921	

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											aat Asn					1017
			_								gat Asp					1065
	_	_									gca Ala					1113
											cac His					1161
											aca Thr 380					1209
											act Thr					1257
											gca Ala					1305
_											tct Ser					1353
	_	_						Ala			ttt Phe					1401
		Gly					Ala				tgc Cys 460					1449
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	_	-		_										gac Asp		1881
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Ile	Ala	Asp	Leu 660	Val	Val	Trp	Asn	Pro 665	Ala	Phe	Phe	Gly	Val 670	Lys	Pro	
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tct Ser	aat Asn 690	gcg Ala	tct Ser	gtg Val	ccc Pro	act Thr 695	cct Pro	cag Gln	ccg Pro	gtt Val	tat Tyr 700	tac Tyr	cgc Arg	gaa Glu	atg Met	2169
ttt Phe 705	Gly	cat His	cac His	ggc Gly	aag Lys 710	gcg Ala	aaa Lys	ttt Phe	gac Asp	acc Thr 715	agc Ser	atc Ile	act Thr	ttt Phe	gtt Val 720	2217
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cgo Arg	: aag	g gtg s Val	ctc Leu 740	Pro	gtg Val	aaa Lys	aac Asn	tgc Cys 745	Arg	aac Asn	ato Ile	acc Thr	aag Lys 750	aag Lys	gac Asp	2313
tto Phe	c aaq	g tto s Phe 755	e Asr	gac Asp	aaa Lys	act Thr	gca Ala 760	Lys	ato s Ile	acc Thr	gto Val	gat L Asp 765	Pro	aaa Lys	acc Thr	2361
tt. Ph	c ga e Gl [.] 77	u Vai	c ttt l Phe	t gta e Val	gat Asp	ggc Gly	y Lys	cto Lev	c tgo ı Cys	aco Thi	tct Sei 78	г ьу	a ccc s Pro	aco Thi	c tct r Ser	2409
ga G1 78	u Va	g cc l Pr	t cta	u Ala	c caa a Gli 79	a Ar	c tac	c ac	t tto	c tto e Pho 799	Э	g gc	ataat	:		2452
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120

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val 100 105 110 Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr

85

115

90

125

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Pro	Thr	Ala	Leu	Ala		Gly	Val	Thr	Thr	Met	Phe	Gly	Gly	Gly	Thr 160
145		_			150	-	71-	mh	mb ~	155	Thr.	Dro	Gl v	T.vs	
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			180					185			Tyr		190		
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Gln		Glu	Ala	Gly	Ala	Ile 215	Gly	Phe	Lys	Leu	His 220	Glu	Asp	Trp	Gly
	210	D	g.~	ת 1 ת	Tle		His	Cvs	Leu	Ser	Val	Ala	Asp	Glu	Tyr
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Asp	Val	Gln	Val	Cys 245		His	Thr	Asp	Thr 250		Asn	Glu	Ala	Gly 255	Tyr
Val	Asp	Asp	Thr		Asn	Ala	Met	Asn	Gly	Arg	Ala	Ile	His	Ala	Tyr
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His	Ile	Glu 275		Ala	Gly	Gly	Gly 280		Ser	Pro	Asp	Val 285	Ile	Thr	Met
Ala	Gly			Asn	Ile	Leu	Pro	Ser	Ser	Thr	Thr	Pro	Thr	Ile	Pro
	290					295					300				
Tyr	Thr	Ile	Asn	Thr	Val	Ala	Glu	His	Leu		Met	Leu	Met	Thr	Cys
305					310				_	315	~ 1	Dh.a		C1 5	320
His	His	Leu	Asp	Lys 325		Ile	Arg	Glu	Asp 330		Gln	Pne	Ser	335	Ser
Arg	Ile	Arg	Pro			Ile	Ala	Ala			Val	Leu	His	Asp	Ile
_			340)				345					350		
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Glv	, Glu			Pro	Arg	Thr	Trp	Gln	Thr	: Ala	Asp	Lys	Asn	Lys	Lys
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Glu	ı Phe	e Gly	, Lys	Leu	Pro	Glu	ı Asp	Gly	Ala	a Asp	Asn	Asp	Asn	Phe	Arg
385	5				390					395			_	_,	400
Ιle	e Lys	s Ar	туг			Lys	ту1	Thi			n Pro	Ala	Leu	415	His
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Gly	y Vai	l Sei	r Glu 420		: Ile	e Gly	y Sei	r val 425		ı Gil	і Сту	гу	430)	Asp
Lev	ı Va.	l Vai	l Tr	Asr	n Pro	Ala	a Phe	e Phe	e Gl	y Val	Lys	Pro	Lys	: Ile	e Val
		43					440					445			
Ile	е Гу	s Gl	y Gl	y Met	. Val			e Sei	r Gl	u Met			Sei	: Ası	n Ala
	45					45.			_		460		- Dha	. Cl,	, Wie
		l Pr	o Th	r Pro			o Va.	ı Ty:	r Ty	r Ar 47		ı Me	. PIII	e GI	y His 480
46	5	_	= -		470		_ നം	~ ~-	_∞ τ1			. Və	1 50	r T.V	
Hi	s Gl	у Lу	s Al	а Ly: 48:		e AS	p Th	r se.	49		r Elle	. va.		49	s Val 5
A].	а Т٧	r Gl	u As:			l Ly	s Gl	u Ly	s Le	u Gl	y Le	ı Gl	u Ar	д Гу	s Val
	1		50		-	-		50					51	0	

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	530	•			-	535					540					
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545					550					555					560	
Leu	Ala	Gln	Arg	Tyr	Thr	Phe	Phe									
				565												
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